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TITLE : PRODUCTION OF OPTICAL SYNTHETIC QUARTZ GLASS

ABSTRACT : PROBLEM TO BE SOLVED: To obtain optical quartz glass having transparency near to a theoretical transmittance in a short wavelength UV light region by thermally treating mirror-polished synthetic quartz glass at a specific temperature and subsequently etching off the surface of the glass in a specific depth.

SOLUTION: The temperature for the thermal treatment is 900-1,200°C, and the depth of the etching is $\geq 0.5 \mu\text{m}$. The short wavelength region of the UV light is $\leq 210 \text{ nm}$. The synthetic quartz glass used as the raw material is preferably highly pure quartz glass for optical uses. For example, the highly pure quartz glass has an alkali(ne earth)metal content of $\leq 200 \text{ ppb}$ and a transition metal (for example, Ni, Cu) content of $\leq 10 \text{ ppb}$, hardly contains other non-metal impurities such as chloride and fluoride, has an inner transmittance of $\geq 90\%$ in a long wavelength UV light region of $> 245 \text{ nm}$ and an inner transmittance of $\geq 90\%$ in a UV light region of 215 to 245 nm, and has good refractive index homogeneity. The agent for the etching treatment includes hydrofluoric acid, the hydrofluoric acid, nitric acid, etc., and is used to etch the surface.

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